U.S. Fire Administration

Topical Fire Research Series

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Christmas/Christmas Tree Fires

FINDINGS

- From December 24th through the 26th, deaths, injuries, and dollar loss increase an average of 50%, 61%, and 43%, respectively.
- As Christmas trees, which are in one-third of all households, dry out, the risk of fires increases.
- The use of candles contributes to the increase in the incidence of holiday fires.
- Cooking fires increase on Christmas Eve and Day, but children playing and arson fires decrease.

Federal Emergency Management Agency
United States Fire Administration
National Fire Data Center
Emmitsburg, Maryland 21727

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The Holiday season is typically regarded as extending from late November to early January and includes Hanukkah, Christmas, Kwanzaa, and New Year's Day. Using the latest 3 years of data, the yearly estimated fire loss for December 24, 25, and 26 is estimated at over $80 million. Each year, these losses result from an estimated 12,000 fires that required a fire department response. These fires cause an annual national average of of approximately 250 injuries and 40 fatalities.

In addition to the holidays themselves, many people choose to celebrate the season by decorating their homes with electric lights, candles, banners, and wreaths. The Christmas tree is among the most popular of these decorations. The Bureau of the Census estimates that there were 101,041,000 households in America in 1998. According to the National Christmas Tree Association, 33 million natural Christmas trees were sold that same year, which means that nearly one-third of American households had a live or cut Christmas tree inside the home.

Each year, newspapers are filled with tragic stories of families killed by fires that are ignited by the family Christmas tree. As the season progresses and trees become drier, the incidence of Christmas tree fires worsens, as shown in the following table.

Average December Fires 1996-1998

Period	Christmas Tree Fires/Day
December 1-14	1.2
December 15-January 1	7.7

In residential structure fires where the ignition point is a Christmas tree or other holiday decoration, the fire is typically more severe in every measurable way. Injuries, fatalities, and property loss are higher than average. This is indicative of the potentially rapid ignition and spread of a tree or decoration fire. One fire official likened a dry Christmas tree to a "bomb" in the middle of one's home. In reaction to winter's cold weather, most people turn up the heat in their homes, which dries Christmas trees even more. Coupled with faulty wiring or lit candles, a Christmas tree provides sufficient fuel to ignite a serious fire. Two examples:

- On January 9, 1999, an electrical short in a string of Christmas lights started a house fire that killed the homeowner, a 50-year old woman who lived alone.[1]

- On December 27, 1998, candles ignited a Christmas tree and killed a father and his son. Both may have been asleep at the time the fire started.[2]

Holiday fires, including those occurring in the days preceding and following Christmas, are typically more severe than fires during the rest of the year (see tabulation at top).

Similar to other holidays, including Thanksgiving, there is a somewhat higher incidence of cooking fires on Christmas Eve and Christmas Day. This is not surprising given the importance of holiday meals to families throughout the nation.

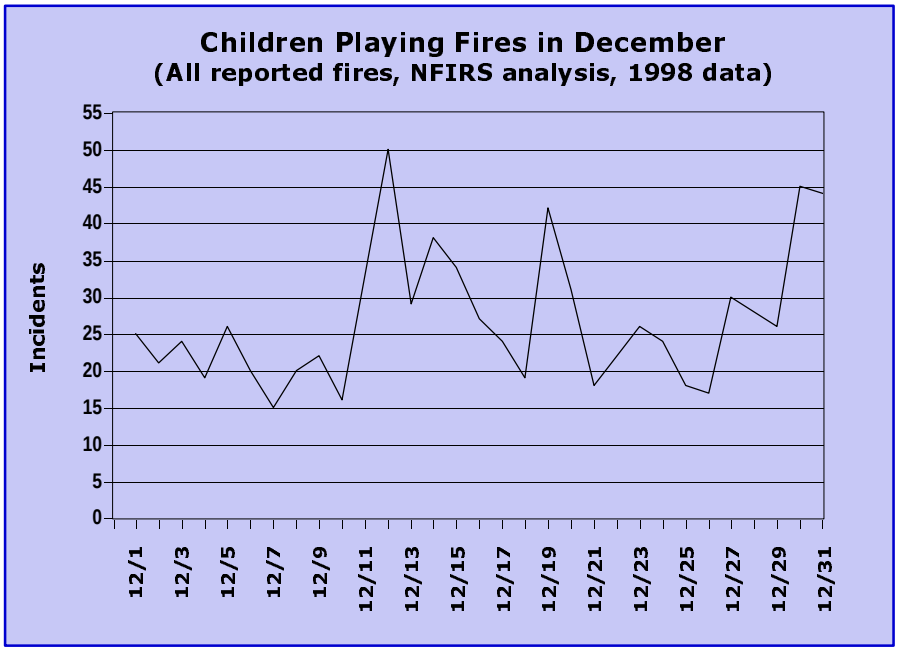
Loss Measures (3-Year Average)

Measure	Average	Dec 24-26
Dollar Loss/Fire	$5,619	$8,063
Injuries/1,000 Fires	15.7	25.2
Fatalities/1,000 Fires	2.4	3.6

The incidence of fires caused by open flame also increases on Christmas Day—7 percent for all of 1998, but 15 percent on Christmas. Open flame fires include those from matches, lighters, and candles.

The most common form of heat of ignition for Christmas fires is that of gas-fueled equipment, including pilot lights and gas fireplaces. Also, Christmas experiences a higher than average incidence of fires caused by candles.

Fires caused by children playing with fire decrease on Christmas Day (see chart). Children playing fires peak in the days just prior to Christmas and sharply decrease on Christmas Day and December 26. In the greater context of this time of year, these trends are not necessarily surprising. Perhaps most importantly, parents are home with their children and, while busy with holiday preparations, may not be able to supervise children



[1]Luo, Michael, "Christmas Tree Blaze Kills Woman," *Los Angeles Times,* January 9, 1999, page B1.

[2]"Holiday Season Keeps Branson Hopping: Cause of Fire Believed To Be Candles," *The Kansas City Star,* December 27, 1998, page B2.

as closely as is necessary. Seeking to emulate the behaviors of their parents, children might attempt to light holiday candles or other decorations. In addition, children are likely to be searching for hidden gifts throughout the home and in their search are probably encountering dangerous items such as lighters and matches. Naturally curious, children play with these items, with sometimes tragic results. Beginning on Christmas Eve, children become more occupied with the celebration and are perhaps less likely to set fires. This trend continues through New Year's Day, about the time their interest in new toys and other gifts wanes.

The incidence of arson fires diminishes on Christmas Day and in the days before, but arson increases after Christmas and peaks on New Year's Day.

METHODOLOGY

This analysis is based primarily on data from the National Fire Incident Reporting System (NFIRS). NFIRS is a data system maintained by the U.S. Fire Administration (USFA). Established in 1975, NFIRS is the largest fire data set in the world. The NFIRS data set is updated annually with nearly one million new fire incident records. Fire departments from all regions of the country report the number and types of fires to which they respond. Although the system is voluntary, an estimated one-third to one-half of the nation's fire departments participate in NFIRS.

Limitations of the NFIRS data set are that it is incomplete—11 states and many fire departments within participating states do not participate in NFIRS—and that an enormous number of smaller fires are not reported to the fire service at all. These unreported fires are generally industrial or residential fires that burn themselves out or are extinguished by the occupant. Despite these shortcomings, the distribution of participants in NFIRS is at least reasonably representative of the entire nation, even though the sample is not random.

Since the data set is incomplete and represents only a sample of American fire departments, many of the numbers in this analysis are national estimates or percentages, rather than raw totals or absolute numbers. Many estimates are derived by computing a percentage from NFIRS and multiplying it by the total number of fires, deaths, injuries, or dollar loss from the NFPA annual survey. Further, in making national estimates, the "unknowns" (entries left blank or reported as unknown) should not be ignored. In this report, included are an estimate for both the specific item and well as an estimate in which unknowns are distributed in the same proportion as the knowns.

Other sources of data may have been used in the preparation of this nalysis. These include the National Fire Protection Association's (NFPA) annual survey of fire departments; mortality data from the National Center for Health Statistics; population data from the Bureau of the Census; arson data from the Bureau of Alcohol, Tobacco, and Firearms; firefighter fatality statistics from the National Institute for Occupational Safety and Health – Firefighter Fatality Investigation and Prevention Program and the USFA's Firefighter Fatality Project; and statistical information from the Consumer Product Safety Commission. The USFA gratefully acknowledges the use of these data and cites these sources where used.

This methodology has been adopted by the USFA; see *Fire in the United States, 1987-1996*, published by the USFA and available at the USFA website (http://www.usfa.fema.gov), for a complete explanation.